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Atty. Dkt. No. ASPI/0002.C1

Serial No.: 10/782,340

REMARKS

This is intended as a full and complete response to the Office Communication of a Notice of Non-Responsive Amendment dated March 1, 2007, having a shortened statutory period for response to expire on April 1, 2007. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-27, 46-54, 56 and 57 remain pending in the application and are shown above. The specification has been amended to correct minor editorial problems as noted by the Examiner.

Claims 9, 10, 26, 46-54, 56 and 57 stand withdrawn by the Examiner and claims 1-8, 11-25 and 27 are examined on the merit and stand rejected. Applicants cancel claims 28-45 and 55 without prejudice and reserve the right to pursue the subject matter of the cancelled claims at a later date. Claims 1, 4, 6, and 27 are amended to correct matters of form and/or to clarify the invention without introducing new matter. Applicants reserve the right to pursue the original claims at a later date. Reconsideration of the rejected claims is requested for reasons presented below.

Claims 1-8, 11-25 and 27 stand rejected under 35 USC § 112, second paragraph, indefinite. Applicant respectfully traverses the rejection.

Claims 1 and 27 and claims dependent thereon are amended to correct informalities and clarify the invention. In claims 1 and 27, substantial and near are deleted to broaden the invention. Claim 6, is amended to recite "comprises", and thus clarify the invention. Applicants reserve the right to pursue the original claims at a later date.

Claims 4 and 5 are amended to include a heat sensitive compound capable of undergoing a change of physical state by heat and heat sensitive compound is properly supported by the specification at least at page 5, lines 17-21, page 18, lines 32-35, page 19, lines 1-23, *etc.*, without introducing new matter. For example, the specification states "matrix material 42 may be a solid or semisolid compound that liquifies upon application of heat and resolidifies when the heat is removed; the matrix material comprises a polymer that retains its semisolid or solid state under heat, the solid support can comprise a heat sensitive compound such as those described above. After

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formation of the matrix, a heat-sensitive support can be removed from the matrix by application of heat to facilitate the removal of template molecules with minimal disruption.....". Accordingly, withdrawal of the objection is respectfully requested.

Claims 1-8, 11-25 and 27 stand rejected under 35 USC § 112, first paragraph, written description. Applicants respectfully traverse the rejection.

Claims 1-8, 11-25 and 27 are amended to correct informalities and clarify the invention without introducing new matter. Applicant reserves the right to pursue the original claims at a later date. Claims 1 and 27 and claims dependent thereon are amended to include the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material. The tail moiety constitute a molecule that mirrors the hydrophobicity of the template molecule (see, page 5, lines 26-27) such that the tail moiety is capable of partitioning in a different phase from a phase of the template moiety in a two-phase system with two immiscible solvents. In addition, the tail moiety of the conjugate molecule may include an immobilized solid support. Further, the conjugate molecule may include a linker. Support in the Specification is found at least at page 4, line 35, page 5, lines 1-9 and lines 22-35, page 6, lines 1-21, and throughout the specification. Method of making imprints are disclosed at least in section 5.3, sub-section 5.3.1, a two-phase method of preparing surface imprints, sub-section 5.3.2, methods utilizing immobilized template molecules, starting from page 12, line 31 to page 21, line 35. Conjugate molecules with a template moiety and a tail moiety or an immobilized template molecule on a support are disclosed and supported at least in section 5.7, conjugate molecules, starting from page 25, lines 16 to page 27, line 14. Withdrawal of the rejection is respectfully requested.

Claims 1-8, 11-25 and 27 stand rejected under 35 USC § 112, first paragraph, enablement. Applicants respectfully traverse the rejection.

Claims 1-8, 11-25 and 27 are amended to correct informalities and clarify the invention without introducing new matter. Claims 1 and 27 and claims dependent thereon are amended to include the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template

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moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material. The tail moiety is capable of partitioning in a different phase from a phase of the template moiety in a two-phase system with two immiscible solvents. In addition, the tail moiety of the conjugate molecule may include an immobilized solid support. Further, the conjugate molecule may include a linker.

For example, a two-phase method of preparing surface imprints is supported and enabled as disclosed in the specification at least from page 13, line 9 to page 18, line 6. As another example, another method of making surface imprint compositions by utilizing immobilized template molecules to contact with a matrix material is supported and enabled as disclosed in the specification at least from page 18, line 7 to page 21, line 35. Imprint cavities are formed by contacting with a conjugate molecule having a tail moiety and a template moiety constituting the template molecule such that the imprint cavities are oriented and localized at the surface of the matrix material. Conjugate molecules with a template moiety and a tail moiety or an immobilized template on a support are disclosed and supported at least in section 5.7, conjugate molecules, starting from page 25, line 16 to page 27, line 14. Applicants submit that the amendments clarify the invention and the amended claims is properly supported and enabled by the specification. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 1-3, 6-8, 11-18, 20-22 and 27 stand rejected under 35 USC § 102(b) as being anticipated by *Arnold, et al.* (US Patent NO.: 5,310,648). Applicants respectfully traverse the rejection.

Arnold, et al. discloses a matrix composed of polymers cross-linked with chelating metals which are pre-organized as interactive moieties in order to interact with a template molecule, such as a predetermined molecule, and form cavities. (See, column 4, lines 11-27; column 4, lines 48-61.) *Arnold, et al.* does not teach, show, or suggest a tail moiety or any imprint cavities formed by contacting with a conjugate molecule having a tail moiety and a template moiety.

Arnold, et al. also discloses that the matrix is later ground and washed (See, Example V, column 12, lines 32-48; Example VII, column 14, lines 49-55) in order to

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capture the template molecule or the predetermined molecule since only a small number of interaction sites are present on the template molecule for metal chelating. For example, only small numbers of histidine residues can be generally present in a protein molecule to chelate with metal residue. In addition, after polymerizing and forming the matrix, there are a lot of unbound template molecules and internalized bound template molecules occupying cavities within the matrix of *Arnold, et al.* and this may impede the release the templates molecules and hindering the capturing of new template molecules. *Arnold, et al.* expresses concern about the limited accessibility of the specific binding sites and recovery of functional template protein in column 15, lines 23-24 as a large portion of the polymer matrix of *Arnold, et al.* are not empty cavities as they are not located near the surface of the polymer matrix to become binding sites for a new template molecule. Thus, the orientation of the cavities of *Arnold, et al.* is not preserved and there is no mention or motivation provided for modification of the template molecule in order to improve its location or orientation within the matrix during polymerization. Accordingly, *Arnold, et al.* does not teach, show, or suggest a surface imprint composition, wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material.

Thus, *Arnold, et al.* does not teach, show, or suggest a surface imprint composition including a matrix material defining imprint cavities of a template molecule, wherein the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material, as recited in amended claims 1, 27 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, 4, 6-8 and 27 stand rejected under 35 USC § 102(b) as being anticipated by *Zhao, et al.* (*Chao, et al.* "Soft lithographic methods for nano-fabrication" *J. Mater. Chem.* 1997, 7(7), 1-69-1074). Applicants respectfully traverse the rejection.

Zhao, et al. discloses a lithographic method for nano-fabrication using microcontact printing, replica molding techniques. Lithography, nano-fabrication, microcontact printing, replica molding are methods used in the semi-conductor industry

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to pattern a feature, such as trench, line, via, *etc.*, on a surface of a semi-conductor silicon substrate. Thus, *Zhao, et al.* is a non-analogous art.

A semi-conductor silicon substrate is formed/fabricated into integrated circuit devices for making computer chips, *etc.* Thus, *Zhao, et al.* does not disclose any imprint compositions. Patterning a surface of a semi-conductor silicon substrate through lithography is completely irrelevant from making a surface imprint composition by contacting a matrix material with a conjugate molecule having a tail moiety and a template moiety constituting a template molecule to define imprint cavities of the template molecule on the matrix molecule, such that a new template molecule can later be captured by the surface imprint composition.

Note that the smallest feature size in Figure 1 is shown to be 0.2 microns or 200 nm and some feature size in Table 1 is under 30 nm, all of these dimension are for patterning semiconductor features and the sizes are too large to distinguish interactions between molecules, such as template molecules in a surface imprint composition, polymers, peptides, proteins, nucleic acids, lipids, and the like.

Thus, *Zhao, et al.* does not teach, show, or suggest a surface imprint composition including a matrix material defining imprint cavities of a template molecule, wherein the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material, as recited in amended claims 1, 27 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-8, 20, 23-25 and 27 stand rejected under 30 USC § 102(b) as being anticipated by *Sobieszek* (Sobieszek, A. "Gradient polycrylamide gel electrophoresis in presence of sodium dodecyl sulfate: A practical approach to muscle contractile regulatory proteins" *Electrophoresis* 1994, 15, 1014-10-20). Applicants respectfully traverse the rejection.

Sobieszek discloses methods of making two gradient polyacrylamide gel electrophoresis (PAGE) systems in the presence of sodium dodecyl sulfate (SDS). Each PAGE gel or slab can have a gradient concentration of 10%-18 % of acrylamide. Thus,

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Sobieszek does not teach, show, or suggest any compositions for imprinting and isolating template molecules or any surface imprint compositions.

The examiner states that *Sobieszek* discloses a template comb made out of Teflon is defined on the loading space of each lane of the PAGE gel. Thus, the template comb of *Sobieszek* is not a molecule. Thus, *Sobieszek* does not teach, show, or suggest a matrix material defining imprint cavities of a template molecule. In addition, the template comb of *Sobieszek* is a comb, a visible solid substance, made out of Teflon, with its size and dimension in mm or cm range, whereas a template molecule for an imprint composition is a molecule in solution with its size and dimension in molecular scale invisible to eye.

Accordingly, *Sobieszek* does not teach, show, or suggest a surface imprint composition including a matrix material defining imprint cavities of a template molecule, wherein the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material, as recited in amended claims 1, 27 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-8 and 11-25 stand rejected under 35 USC § 102(b) as being anticipated by *Yan, et al.* (US Patent NO.: 5,587,273) as evidenced by Wikipedia (The Free Encyclopedia. Vancomycin, Retrieved at <http://en.wikipedia.org/wiki/Vancomycin> on June 21, 2006, pages 1-5) and *Ostash, et al.* "Bacterial transglycosylase inhibitors" Current Opinion in Chemical Biology 2005, 9, 459-466. Applicants respectfully traverse the rejection.

Yan, et al. discloses molecular imprinting technique to form a polymeric film containing imprinting molecules on a surface of a silicon wafer such that the formed silicon wafer can be fabricated into devices for detecting and sensing the presence of the imprinting molecules. (See, Figure1, column 2, lines 27-62) *Yan, et al.* also discloses that the polymeric film is spin-coated onto the surface of the silicon wafer using a solution containing a solvent, a polymeric material capable of reacting with nitrene, a cross-linking agent, a functionalizing monomer, and an imprinting molecule. (See, column 2, lines 65-67, column 3, lines 1-12.) There is no augmentation of the

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imprinting molecule in order to facilitate the location and orientation of the imprinting molecule. Thus, *Yan, et al.* does not teach, show, or suggest contacting a matrix material with a conjugate molecule having a tail moiety and a template moiety.

Ostash, et al. discloses vancomycin and its therapeutic considerations during clinical application. *Ostash, et al.* does not teach, show, or suggest contacting a matrix material with a conjugate molecule having a tail moiety and a template moiety or any other elements lacking in *Yan, et al.*

Yan, et al. and *Ostash, et al.*, alone or in combination, do not teach, show, or suggest a surface imprint composition including a matrix material defining imprint cavities of a template molecule, wherein the imprint cavities are formed by contacting with a conjugate molecule, the conjugate molecule includes a tail moiety and a template moiety constituting the template molecule and wherein a fraction of the imprint cavities are oriented and localized at the surface of the matrix material, as recited in amended claims 1, 27 and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-8, 11-25 and 27 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1-17 of US Patent No.: 6,979,573 ('573) in view of *Yan, et al.* (US Patent No.: 5,587,273). Applicants respectfully traverse the rejection.

Applicants submit herewith a terminal disclaimer over the '573 US patent. As discussed above, *Yan, et al.* does not teach, show, or suggest the invention as claimed. Withdrawal of the rejection is respectfully requested.

New claims 58-63 are presented herein to be considered by the Examiner. The subject matter of the new claims is supported by the specification at least page 4, line 35, page 5, lines 1-9 and lines 22-35, page 6, lines 1-21, and throughout the specification without introducing new matter. The specification support that the tail moiety constitute a molecule that mirrors the hydrophobicity of the template molecule (see, page 5, lines 26-27) such that the tail moiety is capable of partitioning in a different phase from a phase of the template moiety in a two-phase system with two immiscible solvents. In addition, the tail moiety of the conjugate molecule may include an immobilized solid support. Further, the conjugate molecule may include a linker.

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Applicants submit that new claims 58-60 are dependent claims of claim 1 and claims 61-63 are dependent claim of claim 27. With regard to Applicants' previous election of the species of matrix material of Subgroup 1, Applicants respectfully submit that claims 1-27 and claim 58-63 are generic claims readable on the elected species of the matrix material because claims 1-27 and 58-63 recite a matrix material.

With regard to Applicants' previous election of the species of template molecule of Subgroup 2, Applicant submits that claims 1-27 and claims 58-63 are generic claims readable on the elected species of the template molecule because claims 1-27 and 58-63 recite a template molecule.

With regard to Applicants' previous election of the macromolecule of Subgroup 3, Applicant respectfully submits that claims 1-27 and 58-63 are generic claims readable on the elected species of the macromolecule because claims 1-27 and 58-63 recite a macromolecule.

With regard to Applicants' previous election of the array of Subgroup 4, Applicant respectfully submits that claims 23-26 are generic claims readable on the elected species of the two-dimensional array recited in claim 25 because the disclosed two-dimensional array is an array, as recited in claims 23-26.

With regard to Applicants' previous election of the cavities of Subgroup 5, Applicant respectfully submits that claims 1-27 and 58-63 are generic claims readable on the elected species because claims 1-27 and 58-63 recite imprint cavities.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

The examiner noted that the appropriate fees must be paid for the previously filed response to office action. Applicants respectfully submit that the fee for the extension of time for the previous response to Office Action dated July 6, 2006 was paid in full.

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Having addressed all issues set out in the Office Communication, Applicant respectfully submits that, for at least the reasons discussed above, all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

Respectfully submitted,



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